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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/672,236	09/27/2000	Douglas R. Becker	07844-451001	7138

21876 7590 05/19/2004

FISH & RICHARDSON P.C.
3300 DAIN RAUSCHER PLAZA
MINNEAPOLIS, MN 55402

EXAMINER	
THOMPSON, JAMES A	
ART UNIT	**PAPER NUMBER**
2624	

DATE MAILED: 05/19/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No. 09/672,236	Applicant(s) BECKER, DOUGLAS R.
	Examiner James A Thompson	Art Unit 2624

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-26 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-26 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 27 September 2000 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: On page 11, last line, the symbol "400" is referenced, but does not appear in the drawings. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 24 and 26 rejected under 35 U.S.C. 102(a) as being anticipated by Yhann (US Patent 6,031,544).

Claims 24 and 26 are discussed together. The computer program of claim 26 performs the method of claim 24.

Regarding claims 24 and 26: Yhann discloses a method of forming a trap polygon for trapping a color transition edge (column 6, lines 29-33 of Yhann). Said method comprises identifying an interfering edge which intersects a keep away zone

(column 6, lines 40-46 of Yhann) defined by the color transition edge (column 6, lines 29-33 of Yhann).

Said method further comprises calculating a line (C_T) on which traps from the color transition edge and the interfering edge would optimally abut one another (column 6, lines 29-32 of Yhann).

Said method further comprises shaping a trap polygon using the line (column 6, lines 36-39 of Yhann).

Further regarding claim 26: Yhann discloses implementing the steps of a method of forming a trap polygon with a computer program which is physically embodied on a computer-readable medium (column 6, line 66 to column 7, line 4 of Yhann).

Claim Rejection – 35 USC §103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-8, 10-23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yhann (US Patent 6,031,544) in view of McKendrick (US Patent 5,412,877).

Claims 1 and 25 are discussed together. The computer program of claim 25 performs the method of claim 1.

Regarding claims 1 and 25: Yhann discloses a method of forming a trap polygon for trapping a color transition edge (column 6, lines 29-33 of Yhann), where the trap polygon has an associated trap color determined by colors defining the color transition edge (column 6, lines 32-36 of Yhann).

Said method comprises identifying an interfering edge which intersects a keep away zone (column 6, lines 40-46 of Yhann) defined by the color transition edge (column 6, lines 29-33 of Yhann).

Said method further comprises forming a trap polygon (column 6, lines 40-41 of Yhann) for trapping the color transition edge (column 6, lines 30-33 of Yhann) including shaping the trap polygon to avoid overlapping a trap polygon corresponding to the interfering edge (column 6, lines 41-45 of Yhann).

Yhann does not disclose expressly determining a miter equation that defines a line that is half a distance from the color transition edge and the interfering edge along a length of either edge; determining movement equations for points on the trap polygon that need to move due to the proximity of the interfering edge; and shaping the trap polygon including locating each moving point at an intersection of a movement equation and the miter equation.

McKendrick discloses determining a miter equation (figure 3(70) of McKendrick) that defines a line that is half a distance from two edges along the length of either edge (column 6; lines 41-42, lines 48-49, and lines 55-57 of McKendrick). Miter lines (figure 3(70) of McKendrick) are etched on a surface (column 6, lines 41-42 and lines 48-49 of McKendrick) and indicate the angles of the mitered outer ends where bends in a tube

are present (column 6, lines 55-57 of McKendrick). Said etching is controlled by a computer (column 6, lines 31-32 of McKendrick) and must therefore inherently require the determination of a miter equation. Said miter line is located between two edges of two segments of a tube and defines the angle of the bend in said tube (figure 3(70) and column 6, lines 55-57 of McKendrick), thus placing said miter line half a distance from two edges along the length of either edge. Each segment of the tube is inherently a polygon since each segment comprises straight lines and defines a particular region.

McKendrick further discloses movement equations for points on a polygon that need to move (figure 3(70) and column 6, lines 55-57 of McKendrick). Creating a bend in the tube at a particular angle (figure 3(70) and column 6, lines 55-57 of McKendrick) and controlling the bending of said tube with a computer (column 6, lines 31-32 of McKendrick) inherently requires the calculation of movement equations in order to move the polygon defining the segment of tube that is to be bent with respect to an abutting segment of tube (figure 3(54,56,60,62,70) of McKendrick).

McKendrick further discloses shaping a polygon including locating each moving point at an intersection of a movement point and the miter equation (figure 3 and column 6, lines 55-60 of McKendrick). A polygon which defines one segment of the tube is shaped when said tube is bent (column 6, lines 55-57 of McKendrick) and the reference lines are placed precisely (column 6, lines 57-60 of McKendrick). This would inherently require locating each moving point at an intersection of a movement point and the miter equation since said miter line is used to create the proper angle in said tube.

Yhann and McKendrick are combinable because they are from the same problem solving area, namely the manipulation and shaping of polygons for the purpose of defining regions. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the method of shaping polygons using miter lines, as taught by McKendrick, to shape the polygons taught by Yhann at the color transition edge and the interfering edge, said color transition edge and said interfering edge being in close proximity to each other. The motivation for doing so would have been to create a sequence of trap polygons for trapping colors (column 6, lines 29-33 and lines 38-39 of Yhann). Therefore, it would have been obvious to combine McKendrick with Yhann to obtain the invention as specified in claim 1.

Further regarding claim 25: Yhann discloses implementing the steps of a method of forming a trap polygon with a computer program which is physically embodied on a computer-readable medium (column 6, line 66 to column 7, line 4 of Yhann).

Regarding claim 23: All of the elements comprising claim 23 are discussed in the argument regarding claims 1 and 25, which are incorporated herein.

Regarding claim 2: Yhann discloses the trap polygon (column 6, lines 40-41 of Yhann), the color transition edge (column 6, lines 33-39 of Yhann) and interfering edge (column 6, lines 40-45 of Yhann) are vector-based representations (figure 5 of Yhann).

Regarding claim 3: Yhann discloses that the keep away zone encloses the trap polygon (column 6, lines 29-33 of Yhann).

Regarding claim 4: Yhann discloses that the keep away zone is within a tile (figure 2 and column 4, lines 41-43 of Yhann), where the tile includes one or more tile edges (column 5, lines 14-17 of Yhann) and each potentially interfering edge is a tile edge which touches the keep away zone (figure 4 and column 6, lines 29-33 of Yhann).

Regarding claim 5: Yhann discloses that an interfering edge has a paper color on one side (column 5, lines 14-17 of Yhann).

Regarding claim 6: Yhann discloses that the color transition edge is defined by two points (column 6, lines 5-9 of Yhann) and defines a transition between a first color (C_A) and a second color (C_B) (column 6, lines 30-33 of Yhann), and the first color is on a same side of the color transition edge as an interfering edge and the second color is on an opposite side of the color transition edge from the interfering edge (figure 4 and column 6, lines 3-9 of Yhann), and where the interfering edge has a color on one side which would satisfy a trap condition with the first color (column 6, lines 28-33 of Yhann). The trap polygons (C_T) define object in which there are different colors on both sides of the contour segments (column 6, lines 28-33 of Yhann). Therefore, the color on one side of the interfering edge would inherently satisfy a trap condition with the color on the other side of the interfering edge (the first color). Otherwise, no trap polygon would be formed to separate the object have said first color and the object having said second color.

Regarding claim 7: Yhann discloses that the color transition edge is defined by two points (column 6, lines 5-9 of Yhann) and defines a transition between a first color (C_A) and a second color (C_B) (column 6, lines 30-33 of Yhann), and the first color is on a

same side of the color transition edge as an interfering edge and the second color is on an opposite side of the color transition edge from the interfering edge (figure 4 and column 6, lines 3-9 of Yhann), where the interfering edge has an interfering color on one side which would satisfy a trap condition with the second color (column 6, lines 28-33 of Yhann), and the interfering color and the second color indicate a hypothetical trap color which is significantly different from the trap color (figure 1; column 4, lines 53-55; and column 5, lines 14-17 of Yhann). The trap polygons (C_T) define objects in which there are different colors on both sides of the contour segments (column 6, lines 28-33 of Yhann). Therefore, the color on one side of the interfering edge would inherently satisfy a trap condition. Otherwise, no trap polygon would be formed to separate the object have said first color and the object having said second color.

Regarding claim 8: Yhann discloses that the hypothetical trap color differs from the trap color by more than a vignette color transition (figure 1; column 5, lines 14-17; and column 6, lines 29-33 of Yhann). The image comprises multiple trap polygons (figure 1 and column 5, lines 14-17 of Yhann) with different colors for each polygon (column 6, lines 29-33 of Yhann). Since there are noticeably different colors on each side of the color contours (column 6, lines 32-33 of Yhann), then the second, hypothetical, trap color must differ from the first trap color by more than a vignette color transition.

Regarding claim 10: Yhann discloses that the trap color has one or more trap colorant planes and the hypothetical trap color has one or more hypothetical color planes (column 6, lines 32-35 of Yhann). Contour segments are defined (column 5,

lines 27-31 of Yhann). On each side of said contour segments, there are colors comprised of inks (column 6, lines 32-35 of Yhann). Since the trap color and hypothetical are comprised of inks (column 6, lines 32-35 of Yhann), then the trap color and hypothetical color are defined by a color space, such as CMYK. Therefore, the trap color and hypothetical color must each inherently have one or more colorant planes.

Yhann further discloses that any trap colorant plane which would not overprint differs from a corresponding hypothetical colorant plane by more than the vignette color transition (column 5, lines 14-17; and column 6, lines 29-33 of Yhann), where a colorant plane which would overprint would not be printed when printing an object having a color including that colorant plane (figure 1 and column 6, lines 20-23 of Yhann). The interfering lines of the polygons are hidden instead of overprinted (column 6, lines 20-23 of Yhann). The polygons are defined by contours (column 5, lines 14-17 of Yhann) which separate the colors of each polygon (column 6, lines 29-33 of Yhann). Since there are noticeably different colors on each side of the color contours (column 6, lines 32-33 of Yhann), then the color difference between polygons must inherently be more than a vignette color transition.

Regarding claim 11: Yhann discloses shaping one or more edges of the trap polygon so that the trap polygon abuts without overlapping any abutting trap polygon (figure 4 and column 6, lines 53-55 of Yhann) based upon an interfering edge which intersects the color transition edge (column 6, lines 29-33 of Yhann), and so that the trap polygon does not overlap any object edge which is within the keep away zone but does not intersect the color transition edge or any close trap polygon based upon an

interfering edge which is within the keep away zone but does not intersect the color transition edge (figure 4; and column 6, lines 29-33 and lines 53-55 of Yhann). The trap polygons are produced in order to create a color trapped (column 4, lines 53-55 of Yhann), non-overlapping image (figure 1 and column 4, lines 47-50 of Yhann).

Regarding claim 12: Yhann discloses adjusting the trap polygon to avoid one or more interfering edges by adding trimming points (figure 4(1,7) of Yhann) to the trap polygon for points on any interfering edges which are in or on the trap polygon (column 6, lines 1-9 of Yhann); and removing points from the trap polygon which are outside the trimming points (column 6, lines 20-23 of Yhann).

Regarding claim 13: Yhann discloses that the trap polygon is defined by a plurality of points (figure 4 of Yhann) which are of one or more types (column 6, lines 17-20 of Yhann), and wherein shaping the trap polygon includes moving one or more points of the trap polygon according to the type of the point (column 6, lines 53-55 of Yhann). The trap polygon is defined by contour points and hidden points (column 6, lines 17-20 of Yhann). The hidden points are removed in order to shape the trap polygon (column 6, lines 53-55 of Yhann).

Regarding claim 14: Yhann in view of McKendrick discloses that the miter equation defines a line that is half a distance from the color transition edge and the interfering edge along a length of either edge, as discussed in the arguments regarding claims 1 and 25, which are incorporated herein. If a miter equation defines a line that is half a distance from the color transition edge and the interfering edge along a length of

either edge, then it is clearly inherent that said line defined by said miter equation splits a distance between said color transition edge and said interfering edge.

Regarding claim 15: Yhann discloses color transition edges (column 6, lines 29-33 of Yhann) and interfering edges (column 6, lines 20-23 of Yhann).

Yhann does not disclose expressly that, if the color transition edge and the interfering edge are parallel and share an end point, the step of determining a miter line includes locating the miter line as a line that is perpendicular to the color transition edge and including the end point.

McKendrick discloses a miter line (figure 3(70) of McKendrick) that indicates the angle of the outer ends of segments blocks where a tube is bent (column 6, lines 55-57 of McKendrick). If two segment blocks are parallel and share an end point, then the step of determining a miter line would inherently include locating the miter line as a line that is perpendicular to the edges of each of the segment blocks and including the end point, since the angle between the two segment blocks would be zero.

Yhann and McKendrick are combinable because they are from the same problem solving area, namely the manipulation and shaping of polygons for the purpose of defining regions. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the method of determining a miter line taught by McKendrick to determine a miter line between the color transition edge and the interfering edge taught by Yhann. The motivation for doing so would have been to facilitate rapid, highly accurate placement of the polygons (column 6, lines 57-60 of

McKendrick). Therefore, it would have been obvious to combine McKendrick with Yhann to obtain the invention as specified in claim 15.

Regarding claim 16: Yhann discloses color transition edges (column 6, lines 29-33 of Yhann) and interfering edges (column 6, lines 20-23 of Yhann).

Yhann does not disclose expressly that, if the color transition edge and the interfering edge are parallel and have end points that are within a predetermined distance, the step of determining a miter line includes locating the miter line as a line that is perpendicular to the color transition edge and includes one of the end points.

McKendrick discloses a miter line (figure 3(70) of McKendrick) that indicates the angle of the outer ends of segments blocks where a tube is bent (column 6, lines 55-57 of McKendrick). If two segment blocks are parallel and have end points that are within a predetermined distance, then the step of determining a miter line would inherently include locating the miter line as a line that is perpendicular to the edges of each of the segment blocks, since the angle between the two segment blocks would be zero. The miter line simply indicates the angle of the outer ends of segments blocks where a tube is bent (column 6, lines 55-57 of McKendrick), so said miter line can be placed at any desired distance between the two segment blocks. Placing the miter line such that said miter line includes one of the end points of a particular segment block is simply a matter of design choice.

Yhann and McKendrick are combinable because they are from the same problem solving area, namely the manipulation and shaping of polygons for the purpose of defining regions. At the time of the invention, it would have been obvious to a person of

ordinary skill in the art to use the method of determining a miter line taught by McKendrick to determine a miter line between the color transition edge and the interfering edge taught by Yhann. The miter line could then be placed so that said miter line includes one of the end points of the color transition edge. The motivation for doing so would have been to facilitate rapid, highly accurate placement of the polygons (column 6, lines 57-60 of McKendrick). Therefore, it would have been obvious to combine McKendrick with Yhann to obtain the invention as specified in claim 16.

Further regarding claim 17: If said predetermined distance is greater than half a pixel, a new region in the digital image would be created that is detectable as one pixel in width. If said predetermined distance is less than half a pixel, then the color transition edge and the interfering edge would be adjacent in the digital image. Therefore, setting said predetermined distance to half a pixel would be the logical choice and within the capability one of ordinary skill in the art.

Regarding claim 18: Yhann discloses color transition edges (column 6, lines 29-33 of Yhann) and interfering edges (column 6, lines 20-23 of Yhann).

Yhann does not disclose expressly that the movement equations have a direction and a length that is at least half a distance from the color transition edge to the interfering edge.

McKendrick discloses movement equations for points on a polygon that need to move (figure 3(70) and column 6, lines 55-57 of McKendrick). Creating a bend in the tube at a particular angle (figure 3(70) and column 6, lines 55-57 of McKendrick) and controlling the bending of said tube with a computer (column 6, lines 31-32 of

McKendrick) inherently requires the calculation of movement equations in order to move the polygon defining the segment of tube that is to be bent with respect to an abutting segment of tube (figure 3(54,56,60,62,70) of McKendrick). Since the two segments of tube are initially connected before being bent (column 6, lines 55-57 of McKendrick), then the direction and length which the movement equations require movement will inherently be greater than the distance from one segment block to the other segment block.

Yhann and McKendrick are combinable because they are from the same problem solving area, namely the manipulation and shaping of polygons for the purpose of defining regions. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the method of calculating movement equations taught by McKendrick to calculate the direction and length the color transition edge and interfering edge move with respect to each other. The motivation for doing so would have been to facilitate rapid, highly accurate placement of the polygons (column 6, lines 57-60 of McKendrick). Therefore, it would have been obvious to combine McKendrick with Yhann to obtain the invention as specified in claim 18.

Regarding claim 19: Yhann discloses color transition edges (column 6, lines 29-33 of Yhann) and interfering edges (column 6, lines 20-23 of Yhann).

Yhann does not disclose expressly, in a first coordinate space, determining if a point is between the end points that define the color transition edge, and if so, locating a movement equation that passes through the point and is perpendicular to the color transition edge.

McKendrick discloses in a first coordinate space (column 5, lines 57-60 of McKendrick), determining points from a plurality of lines (figure 3(64,66,68) of McKendrick) that intersect the miter line (figure 3(70) of McKendrick) and are used in defining the segment blocks of the tube (column 6, lines 42-49 of McKendrick). As can be seen from figure 3 of McKendrick, labels 66 and 68 refer to the outside and inside reference lines representing the outside permissible position of the tube (column 6, lines 46-48 of McKendrick). Said points are points that are on the center line (figure 3(64) of McKendrick) and points that are on the lines that are parallel to said center line (figure 3(66,68) of McKendrick) and are therefore between the end points of said segment block. Said tube is bent based on said miter line (column 6, lines 55-57 of McKendrick) and the etching is controlled by a computer (column 6, lines 31-32 of McKendrick). Therefore, a movement equation must inherently be calculated in order to shape said tube at the proper angle. Since said plurality of lines define said tube (column 6, lines 42-49 of McKendrick), said movement equations must be in the same direction. Said direction is perpendicular to said segment block, as can clearly be seen in figure 3 of McKendrick.

Yhann and McKendrick are combinable because they are from the same problem solving area, namely the manipulation and shaping of polygons for the purpose of defining regions. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the method of locating movement equations and reshaping a segment block, as taught by McKendrick, and apply said method to the color transition edge taught by Yhann. The motivation for doing so would have been to

facilitate rapid, highly accurate placement of the polygons (column 6, lines 57-60 of McKendrick). Therefore, it would have been obvious to combine McKendrick with Yhann to obtain the invention as specified in claim 19.

Regarding claim 20: Yhann discloses color transition edges (column 6, lines 29-33 of Yhann) and interfering edges (column 6, lines 20-23 of Yhann).

Yhann does not disclose expressly that, if the point is outside the end points, locating a movement equation that passes through the point and a closest end point on the color transition edge.

McKendrick discloses moving a plurality of lines (figure 3(64,66,68) of McKendrick) that intersect the miter line (figure 3(70) of McKendrick) and are used in defining the segment blocks of the tube (column 6, lines 42-49 of McKendrick). Said tube is moved and reshaped (column 6, lines 49-51 of McKendrick), said moving and reshaping being performed by a computer (column 6, lines 31-32 of McKendrick), thus inherently requiring the calculation of movement equations. If the point is outside of the end points of the line separating the segment blocks (figure 3(54) of McKendrick), said movement equation must inherently pass through the point and a closest end point on said line in order to perform the proper movement to reshape said tube (column 6, lines 49-52 of McKendrick).

Yhann and McKendrick are combinable because they are from the same problem solving area, namely the manipulation and shaping of polygons for the purpose of defining regions. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the method of locating movement equations and

reshaping a segment block, as taught by McKendrick, and apply said method to the color transition edge taught by Yhann. The motivation for doing so would have been to facilitate rapid, highly accurate placement of the polygons (column 6, lines 57-60 of McKendrick). Therefore, it would have been obvious to combine McKendrick with Yhann to obtain the invention as specified in claim 20.

Regarding claim 21: Yhann discloses a method of forming a trap polygon for trapping a color transition edge (column 6, lines 29-33 of Yhann).

Yhann does not disclose expressly that the movement equations are movement vectors that have a direction and a length.

McKendrick discloses movement equations for points on a polygon that need to move (figure 3(70) and column 6, lines 55-57 of McKendrick). Creating a bend in the tube at a particular angle (figure 3(70) and column 6, lines 55-57 of McKendrick) and controlling the bending of said tube with a computer (column 6, lines 31-32 of McKendrick) inherently requires the calculation of movement equations in order to move the polygon defining the segment of tube that is to be bent with respect to an abutting segment of tube (figure 3(54,56,60,62,70) of McKendrick). Since the bend in the tube is created at a particular angle, then said movement equations are inherently movement vectors that have a direction and a length.

Yhann and McKendrick are combinable because they are from the same problem solving area, namely the manipulation and shaping of polygons for the purpose of defining regions. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the method of calculating movement equations taught by

McKendrick to calculate the direction and length the color transition edge and interfering edge move with respect to each other. The motivation for doing so would have been to facilitate rapid, highly accurate placement of the polygons (column 6, lines 57-60 of McKendrick). Therefore, it would have been obvious to combine McKendrick with Yhann to obtain the invention as specified in claim 21.

Regarding claim 22: Yhann discloses color transition edges (column 6, lines 29-33 of Yhann) and interfering edges (column 6, lines 20-23 of Yhann).

Yhann does not disclose expressly that the movement vectors length is at least half a distance between the color transition edge and the interfering edge along the entire length of both edges.

McKendrick discloses movement vectors for points on a polygon that need to move (figure 3(70) and column 6, lines 55-57 of McKendrick). Creating a bend in the tube at a particular angle (figure 3(70) and column 6, lines 55-57 of McKendrick) and controlling the bending of said tube with a computer (column 6, lines 31-32 of McKendrick) inherently requires the calculation of movement vectors in order to move the polygon defining the segment of tube that is to be bent with respect to an abutting segment of tube (figure 3(54,56,60,62,70) of McKendrick). Since the two segments of tube are initially connected before being bent (column 6, lines 55-57 of McKendrick), then the movement vectors require movement that will inherently be greater than the distance from one segment block to the other segment block along the entire length of both segment blocks.

Yhann and McKendrick are combinable because they are from the same problem solving area, namely the manipulation and shaping of polygons for the purpose of defining regions. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the method of calculating movement equations taught by McKendrick to calculate the direction and length the color transition edge and interfering edge move with respect to each other. The motivation for doing so would have been to facilitate rapid, highly accurate placement of the polygons (column 6, lines 57-60 of McKendrick). Therefore, it would have been obvious to combine McKendrick with Yhann to obtain the invention as specified in claim 22.

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yhann (US Patent 6,031,544) in view of McKendrick (US Patent 5,412,877) and Yeomans (US Patent 5,402,534).

Regarding claim 9: Yhann discloses that the hypothetical trap color differs from the trap color by more than a vignette color transition (figure 1; column 5, lines 14-17; and column 6, lines 29-33 of Yhann), as discussed in the argument regarding claim 8.

Yhann in view of McKendrick does not disclose expressly that the vignette color transition is approximately 5%.

Yeomans discloses a vignette color transition (figure 3(variation from nominal value) of Yeomans) that is approximately 5% (column 3, lines 20-26 of Yeomans). A change in the range of 10 quantization steps (column 3, lines 24-26 of Yeomans) is approximately 5% for 256 possible gray level values. Furthermore, the vignette color

transition begins with a variation of 1 quantization step (column 2, lines 63-65 of Yeomans) and increases (figure 3 of Yeomans).

Yhann in view of McKendrick is combinable with Yeomans because they are from the same field of endeavor, namely the control of color printing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to make the trap colors differ by more than 5%. The motivation for doing so would have been that, below a vignette color transition of 5%, the separation band between the polygons will not be noticeable (column 1, lines 24-32 of Yeomans). Therefore, it would have been obvious to combine Yeomans with Yhann in view of McKendrick to obtain the invention as specified in claim 9.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Steven J. Harrington, US Patent 6,236,754 B1, May 22, 2001.

Paul Donald Healey, US Patent 5,832,127, November 3, 1998.

Bjorge et al., US Patent 5,295,236, March 15, 1994.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A Thompson whose telephone number is 703-305-6329. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703-308-7452. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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James A. Thompson
Examiner
Art Unit 2624

JAT
April 29, 2004

David K Moore

DAVID MOORE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600